

IN THE CLAIMS:

1-13. (Canceled)

14. (Previously Presented) An optical node comprising:

a first optical line terminal having an all-optical-pass-through port side interface including a plurality of port side transmit ports, each to transmit a respective one of a plurality of optical wavelengths, and a plurality of associated port side receive ports, to receive respective ones of the plurality of optical wavelengths, the first optical line terminal including at least one transponder connected to a predetermined one of the transmit ports and also connected to an associated one of the port side receive ports, the at least one transponder including a loopback mechanism to perform looping back of an optical wavelength received at the associated one of the port side receive ports to the predetermined one of the port side transmit ports;

a second optical line terminal having an all-optical-pass-through port side interface including a plurality of port side transmit ports, each to transmit a respective one of the plurality of optical wavelengths, and a plurality of associated port side receive ports, to receive respective ones of the plurality of optical wavelengths, the second optical line terminal including at least one transponder connected to a predetermined one of the port side transmit ports and also connected to an associated one of the port side receive ports, the at least one transponder including a loopback mechanism to perform looping

back of an optical wavelength received at the associated one of the port side receive ports to the predetermined one of the port side transmit ports; and

an optical connection, optically connecting at least one of the port side transmit ports of the first optical line terminal to at least one of the port side receive ports of the second optical line terminal, and connecting at least one port side receive port of the first optical line terminal to at least one transmit port of the second optical line terminal.

15. (Canceled)

16. (Previously Presented) An optical line terminal comprising:

an interface having a receive port to receive an optical signal, including a test optical signal, that originated from an originating optical node and also having a transmit port to transmit the optical signal, including the test optical signal, back to the originating node;

at least one further communication interface;

at least one transponder coupled between the interface and the at least one further communication interface, the at least one transponder being coupled to the at least one further communication interface through at least one communication terminal of the at least one transponder, the at least one transponder also having a transmit output terminal and a receive input terminal;

at least one optical switch having four terminals, with a first terminal connected to the receive port and a second terminal connected to the transmit port of the interface, and a third terminal connected to the receive input terminal and a fourth terminal connected to the transmit output terminal of the at least one transponder, the at least one optical switch having a normal state in which a first optical path is provided from the first terminal to the third terminal of the at least one optical switch to provide an optical connection from the receive port of the interface to the receive input terminal of the at least one transponder, and a second optical path is provided from the second terminal to the fourth terminal of the at least one optical switch to provide an optical connection from the transmit output terminal of the at least one transponder to the transmit port of the interface, the at least one optical switch having a loopback state in which a third optical path is provided from the first terminal to the second terminal of the at least one optical switch to loopback the optical signal including the test optical signal received at the receive port to the transmit port of the interface, and a fourth optical path is provided from the third terminal to the fourth terminal of the at least one optical switch to loopback the optical signal including the test optical signal transmitted from the transmit output terminal to the receive input terminal of the at least one transponder, wherein while in the loopback state, the at least one optical switch does not convert the optical signal, including the test optical signal, to electrical form; and

at least one multiplexer/demultiplexer optically coupled between the at least one communication terminal of the at least one transponder and the at least one further communication interface.

17. (Previously Presented) An optical line terminal comprising:

- an interface having a receive port to receive optical signals, and a transmit port to transmit optical signals;
- at least one line side communication interface;
- at least one transponder coupled between the interface and the at least one line side communication interface, the at least one transponder being coupled to the at least one line side communication interface through at least one communication terminal of the at least one transponder, the at least one transponder also having a transmit output terminal and a receive input terminal;
- at least one optical switch to either perform at least one of looping back an optical signal received at the receive port to the transmit port of the interface, and looping back an optical signal transmitted from the transmit output terminal to the receive input terminal of the at least one transponder, or perform forwarding of at least one optical signal between the interface and the at least one line side communication interface through the at least one transponder, the optical switch having first and second switch terminals connected to the transmit port and receive port, respectively, of the interface, and having third and fourth switch terminals connected to the transmit output terminal and the receive

input terminal, respectively, of the at least one transponder, wherein when performing looping back, the optical switch does not convert the optical signal to electrical form; and  
at least one multiplexer/demultiplexer optically coupled between the at least one communication terminal of the at least one transponder and the at least one line side communication interface.

18-29. (Canceled)

30. (Previously Presented) An optical line terminal, comprising:  
a line interface having a line side transmit port to transmit an optical signal and a line side receive port to receive an optical signal;  
a port side interface having a port side transmit port to transmit an optical signal and a port side receive port to receive an optical signal;  
and a transponder connected to the line side transmit port and the line side receive port of the line side interface, and also connected to the port side transmit port and port side receive port of the port side interface, the transponder including a loopback mechanism to perform at least one of looping back of the received optical signal at the line side receive port to the line side transmit port and looping back of the received optical signal at the port side receive port to the port side transmit port,  
wherein the loopback mechanism comprises:

a first switch connected to switch the received optical signal at the line side receive port between a first path leading to the port side transmit port and a second path leading to the line side transmit port;

a second switch connected to select between the second path and a third path leading from the port side receive port and to provide an output leading to the line side transmit port;

a third switch connected to select between the first path and a fourth path leading from the port side receive port and to provide an output leading to the port side transmit port; and

a fourth switch connected to switch the received optical signal at the port side receive port between the third path leading to the line side transmit port and the fourth path leading to the port side transmit port.

31. (Previously Presented) An optical line terminal, comprising:

a line interface having a line side transmit port to transmit an optical signal and a line side receive port to receive an optical signal;

a port side interface having a port side transmit port to transmit an optical signal and a port side receive port to receive an optical signal;

a transponder connected to the line side transmit port and the line side receive port of the line side interface, and also connected to the port side transmit port and port side receive port of the port side interface, the transponder including a loopback

mechanism to perform one of looping back the received optical signal at the line side receive port to the line side transmit port and looping back the received optical signal at the port side receive port to the port side transmit port; and

a multiplexer/demultiplexer connected between the transponder and the line side transmit and receive ports.

32. (Canceled)

33. (Currently Amended) The optical node of claim ~~[[32]]~~ 14, wherein the loopback mechanism comprises a 2x2 optical switch.

34. (Canceled)

35. (Currently Amended) The optical ~~node~~ line terminal of claim ~~[[33]]~~ 30, wherein the ~~loopback mechanism further comprises a further 2x2 optical switch~~ first and fourth switches are switch/bridges and the second and third switches are selectors.

36. (Canceled)

37. (Currently Amended) The optical ~~node~~ line terminal of claim ~~[[13]]~~ 31, wherein the loopback mechanism comprises a 2x2 optical switch.

38.-39. (Canceled)

40. (New) The optical node of Claim 14, wherein the optical wavelength looped back by the loopback mechanism is a test optical signal.

41. (New) The optical node of Claim 14, wherein the first and second optical line terminals each include a further transponder including a further loopback mechanism formed of a 2x2 optical switch.

42. (New) The optical node of Claim 14, wherein the optical connection is a wavelength division multiplex connection system.

43. (New) The optical line terminal of Claim 17, wherein each optical signal looped back by the at least one optical switch is a test optical signal.

44. (New) The optical line terminal of Claim 30, wherein the received optical signal at the line side receive port and looped back by the loopback mechanism to the line side transmit port is a test optical signal.

45. (New) The optical line terminal of Claim 30, further comprising a multiplexer/demultiplexer between the line side interface and the transponder.



46. (New) The optical line terminal of Claim 31, wherein the received optical signal at the line side receive port and looped back by the loopback mechanism to the line side transmit port is a test optical signal.

47. (New) The optical line terminal of Claim 31, wherein the optical line terminal is connected to an external equipment via the port side interface.